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The great advances in the last
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computing covered in this dicti

- algorithms and their prope
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- data structures and file stru
- operating systems and con
- computer organization and
- hardware, including proces
- computer communications
- information technology
- computer applications and
- major computer manufactu
- legal aspects of computing

The entries in the dictionary ha
branches of computing and in t
range from basic ideas and equ
level computer science; some e
tables. The dictionary should be
science and of all subjects in wl
be a valuable reference book to
of computing as well as to the i

A major undertaking by over
the dictionary has been compile
Market House Books Ltd. The
and appreciation to the many co
effort.

September 1989

message is submitted whole or assembled by means of a dialogue). A transaction reflects some "real-world" event.

2. The *file updating or database updating process initiated by a single input message, i.e. by a transaction. In a *multiaccess system, transactions that are processed concurrently can give rise to problems in maintaining file or *database integrity.

transaction file (movement file) A file, especially a *data file, containing transaction records, prior to the updating of a *master file. Transaction files are only used in *batch processing systems. Once updating has been carried out, the transaction file may be kept in order to permit subsequent recovery of the master file (*see* file recovery).

transaction processing A method of organizing a *data processing system in which *transactions are processed to completion as they arise. A *transaction processing monitor* (*TP monitor*) is a software system that facilitates the handling of transactions in such circumstances. *Compare* batch processing.

transborder dataflow The most complex legal topic yet to be created by the use of computers in society. When a person in Germany contacts an Irish database, combines the information with information extracted from a Swiss reference manual stored in digital format on a computer in France, and sends the output to Australia, Zambia, and Taiwan where it is recorded on disk with no eye-readable copies produced, he creates a literary work that falls outside any conventions that at present exist concerning *copyright. He also may have breached the *data protection legislation of several countries. With the growth in the use of satellites and wideband communication facilities, the importance of transborder dataflow will grow in the 1990s and hence new conventions will have to be drafted.

transceiver *Acronym for* transmitter and receiver. A device that can both transmit and receive signals on a communication medium. Many communication devices, including *modems, *codecs, and terminals, are transceivers.

transducer 1. Any device that converts energy in the form of sound, light, pressure, etc., into an equivalent electrical signal, or vice versa. For example, a photoconductor converts light and ultraviolet radiation into electrical energy, a piezoelectric device converts mechanical stress into electrical energy (and vice versa).

2. In formal language theory, any *automaton that produces output.

transfer rate *See* data transfer rate.

transformation 1. *Another name for* function, used especially in geometry.

2. of programs. *See* program transformation.

3. of statistics data. A change of scale used to improve the validity of statistical analyses. For data in which small values have smaller *variance than large values a logarithmic or square-root transformation is often recommended. For data in the form of proportions, a transformation from the scale (0,1) to an infinite scale is advisable before performing *analysis of variance or *regression analysis. Several transformations exist for proportions, such as the *logistic or log-odds-ratio that is used in the analysis of *generalized linear models. Appropriate transformations may be suggested by studying *residuals in a regression analysis.

transformational semantics *See* program transformation.

transformation matrix An $m \times n$ matrix of numbers used to map vectors with n elements onto vectors with m elements.

transformation monoid *See* transformation semigroup.

transformation semigroup A *
consisting of a collection C of
mations of a *set S into itself
tion), the *dyadic operation •
*composition of functions: it i
that the set C should be *cl
respect to composition, i.e. if
are in C then so is $c_1 \circ c_2$.

If the identity transforma
identity function) is include
transformation semigroup, a *t*
tion monoid results. Every mon
morphic to a transformation m

transform domain *See* filtering.

transient error An error that oc
or at unpredictable intervals.
error rate.

transistor A semiconductor de
ing, in general, three terminals
attached to electrode regions v
device. Current flowing betwee
these electrodes is made to
response to voltage or current
imposed on the third electr
device is capable of current c
amplification depending on the
lar circuit implementation emp
can also be used as a switch b
it between its maximum and r
of current flow.

The transistor was invented
by Shockley, Brattain, and Ba
Bell Telephone Labs. As per
and manufacturing techniques i
there was a huge growth in
technology.

See also bipolar transistor, fi
transistor, MOSFET.

transistor-transistor logic *See* T

transitive closure of a *transitiv
relation R. A relation R^* define
lows:

$$x \; R^* \; y$$

iff there exists a sequence

$$x = x_0, x_1, \ldots, x_n = y$$

such that $n > 0$ and

$$x_i \; R \; x_{i+1}, \; i = 0,1,2, \ldots,$$